

Appendix 12d**REPORT**

to occupy the academic position:

"Professor"	
"Associate Professor"	X
	one of the academic positions indicated shall be marked with the sign "X"

Candidates to occupy the position:

1	Chief assistant	Dr.	Dimitar	Tsvetkov	Peshev	UCTM-Sofia
№	academic position	scientific degree	name	middle name	last name	workplace

Scientific area:

5	Technical Sciences
code	name

Professional area:

5.10	Chemical Technology
code	name

Scientific specialty:

Processes and apparatus in chemical and biochemical technology
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The competition has been announced:

101	27 Dec 2019	Chemical Engineering	Faculty of Chemical and Systems Engineering
in SG issue	date	for the needs of the Department	Faculty

The report was written by:

Assoc.Prof.	Dr.	Snejanka	Alexandrova	Uzunova	UCTM-Sofia
academic position	scientific degree	name	middle name	last name	workplace

1. Report for the candidate:

Chief Assistant	Dr.	Dimitar	Tsvetkov	Peshev
academic position	scientific degree	name	middle name	last name

1.1. Meeting the minimum requirements under the Regulations:

A) The candidate meets the minimum requirements	20 points	X
B) The candidate doesn't meet the minimum requirements	0 points	
		one of the answers given is marked with the sign "X"

It must be filled in if answer B is marked. The publication activity of the candidate is analyzed. The response of the results achieved (quoted) is analyzed.

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1.2. Relevance of scientific and / or applied research:

A) The research is relevant. Part of the research is pioneering (no results are known on the topic by other authors)	8 points	X
B) Research is relevant. Results from other authors are known for each of the topics and / or applications studied.	6 points	
C) Most of the research is relevant, but also some results are presented that have no scientific and / or applied value	4 points	
D) The smaller part of the research is relevant	2 points	

E) Research is not relevant	0 points	
		one of the answers given is marked with the sign "X"

The evaluation of the relevance of the research must be substantiated.		
<p>The applicant's studies, have the following main targets represented in 32 publications:</p> <ul style="list-style-type: none"> - Processing of natural extracts by nanofiltration in aqueous medium or organic solvents as well as by reverse osmosis; encapsulation of natural extracts using spouted-bed; - Rheology, hydrodynamics and mass transfer in film flows on a horizontal rotating disk; - Biosorption of heavy metals by free microorganisms and immobilized ones; - Modeling of chemical vapor deposition. <p>The publications have included in the second trend of investigations are a continuation and upgrade the investigations, related to the topic of the candidate's PhD thesis. The actuality of investigation is due to :</p> <ul style="list-style-type: none"> (i) The growing interest during last decades concerning with the extraction of bioactive natural components from different plants, suitable for direct use in the medicine, cosmetics, food and pharmaceutical industries. This approach is connected with replacement of the traditional evaporation process with nanofiltration one as an alternative; with a deep inside knowledge for the membrane separation mechanism as well as steady and adequate models for its description (1-st trend). (ii) Disturbed ecological balance and irreversible depletion of a number of natural raw materials. This directs research towards designing and implementing of more efficient processes and apparatus, which can be significantly intensified also by use of thin-film streams (2-nd trend). (iii) Increased release of heavy metals into the environment as a result of agricultural, industrial and military activities, leading to the need of more environmentally friendly technologies and more efficient waste treatment. The use of biosorbents to clean up different media has low operational costs, due to the fact that biomass is renewable feedstock (3-rd trend). (iv) Increasingly wide application in modern technologies of thin layers, made from different materials. The current trend is to obtain multilayer structures, which lead to significant improvement functional characteristics of the coatings, and especially of their hardness and durability. One of the most commonly used approach is plasma enhanced chemical vapor deposition method (4th trend). 		

1.3. Objectives of the research:

A) Realistic and of scientific and / or applied interest	8 points	X
B) Realistic, but not of scientific and / or applied interest	4 points	
C) Unattainable (unrealistic)	0 points	
		one of the answers given is marked with the sign "X"

Objectives must be specified. The type of the set objectives must be justified

The goals set in the research are theoretical and experimental by their nature and they are related to:

- Integrated process including extraction from a system solid-liquid and nanofiltration as an energy save alternative to energy-intensive evaporation schemes for concentrating and separating valuable bioactive substances from solutions by use of a new generation nanomembranes, durable of different organic solvents.
- Theoretical and experimental investigation of the mass transfer of absorption/desorption process as well as dissolution in film flow of Newtonian and non-Newtonian fluids upon a horizontal rotating disk
- Investigation of different techniques suitable for immobilization of microbial biomass in different media for treatment of heavy metal ions in wastewater
- Creation of useful theoretical models, successfully describing the processes of a chemical deposition from multi-component vapor mixtures; Investigation of the plasma enhanced chemical vapor deposition for modeling of nano- and ultrafiltering membranes.

1.4. Candidate research contributions:

A) With lasting scientific and / or applied response, they form the basis for new research and applications	20 points	X
B) They are of significant scientific and / or applied interest, complete and / or summarize previous research	16 points	
C) They are of scientific and / or applied interest	12 points	
D) Lack of significant contributions	8 points	
E) Lack of contributions	0 points	

		one of the answers given is marked with the sign "X"
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Contributions must be specified. The type of results achieved must be justified.
<p>The publications submitted for participation in the competition, both in and outside the habilitation work, have a fundamental and applied character:</p> <ul style="list-style-type: none"> - A complex technology for extracting of valuable biocomponents and concentrating the extracts by nanofiltration has been proposed and experimentally tested; - A large-scale mathematical model describing OSN processes has been developed and experimentally validated; custom OSN unit operations have been designed for basic membrane separation processes such as batch concentration (BC), constant volume semi-batch separation (CVS) and steady state mode separation (SS), based on state-of-the-art software tools for predicting the membrane mass transfer; a methodology for modeling of hydrodynamics and mass transfer in spiral-wound membrane modules is proposed, which is used to predict the results of a batch concentration process; - For the first time efficiency of batch encapsulation at low temperatures of rosemary extracts obtained from aqua-spiritus solutions by use of spouted-bed technique was investigated; - A new method for determining the yield stress of viscous-plastic non-Newtonian liquids is proposed; for the first time a solution of the convective mass transfer equation assuming negligible molecular transfer in the radial direction and convective transfer in axial direction in the case of a film flow of a liquid whose rheological behaviour is described by the power-low rheological model was proposed; - PVA/organosilanes (ETMS, MTES, TEOS, etc.) based hybrid materials have been synthesized. The hybrids were successfully used as immobilizer matrices for <i>Trichosporon cutaneum</i> R57 cells. The synthesized materials possess good adsorption ability in aqueous media toward heavy metal ions; - An approach of great certainty for determination of the necessary precursor layer height to obtain stationarity during the chemical vapor deposition process (CVD) was suggested; the proposed approach can be used in the design of non-standard bubblers or bubblers for new precursors; - A new solution based on a model who proposes to achieve full utilization of the precursors and constant composition of the reaction mixture during CVD was proposed; - The effect of plasma enhanced chemical vapour deposition of polymers on structure and efficiency of nano- and ultrafiltration membranes was investigated.

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1.5. Participation of the candidate in the achievement of the presented results:

A) The candidate has at least an equal participation in the submitted papers	8 points	X
B) The candidate has at least an equal participation in most of the submitted papers	7 points	
C) The candidate has a secondary participation in most of the submitted papers	4 points	
D) The candidate participation is unnoticeable	0 points	
		one of the answers given is marked with the sign "X"

Critical notes must be provided if one of the items C or D is marked.

1.6 Pedagogical activity:

A) The candidate has effective and sufficient pedagogical activity at the university. The textbooks issued are modern and useful (they meet the requirements of the Regulations). The work with undergraduate and doctoral students is at a high professional level.	8 points	X
B) The candidate has sufficient pedagogical activity at the university. The textbooks issued satisfy the requirements of the Regulations.	6 points	
C) The pedagogical activity and / or textbooks issued are insufficient (do not meet the requirements of the Regulations)	0 points	
		one of the answers given is marked with the sign "X"

Critical notes must be provided if one of the items B or C is marked.

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1.7. Critical notes:

A) Lack of critical notes	8 points	X
B) Critical notes of a technical nature	7 points	
C) Critical notes that would partially improve the results achieved in a small part of the research	5 points	
D) Critical notes that would partially improve the results achieved in most of the research	3 points	
E) Significant critical notes	0 points	
		one of the answers given is marked with the sign "X"

Critical notes must be provided if one of the answers C, D or E is marked.

1.8. Conclusion

A) The evaluation of the candidate's activity is POSITIVE	This evaluation is assigned to a total number of at least 50 points	X
B) The evaluation of the candidate's activity is NEGATIVE	This evaluation is assigned to a total number below 50 points	
		one of the answers given is marked with the sign "X"

To be filled in if requested by the member of the scientific jury
The candidate, Chief Assistant Dimitar Peshev has presented all the necessary documents, in accordance with terms and conditions predefined in the Law on the Development of the Academic Staff in Republic of Bulgaria and the relevant Regulations.

The number of points per group of indicators exceeds the minimum has required for occupy the academic position Associate Professor, as follow: for the Indicator № 4 the points are 128 against the minimum requirement of 100; the number of points related to Indicators №№ 5 to 11 are 217, at a minimum requirement of 200; the number of points for the Indicators №№ 12 to 15 are 2360, at minimum requirement level of 50.

To participate in the contest candidate has presented 32 publications. Sixteen of the represented articles are published in journals, referenced and indexed in scientific databases (ISI WoS/Scopus) with summary IF score of 44.6. Eight of them are published in journals out of above mentioned scientific databases; 7 are published in peer review issues and one in a textbook. The activity of the candidate, expressed by dissemination of his science achievements to the community is as follow: the total number of citations is 237. In seven out of represented publications, the candidate is first author, in the rest he is co-authore. Dr. Peshev as sole author has published textbook for the UCTM students.

The candidate has good lecture activity: three courses for students of full-time and part-time form of education provided on Bulgarian and English languages. Dr. Peshev was invited lecturer at some foreign universities and institutes. He has participated in a number of projects funded by the European Commission, the NSF and industry partners, in some of which as a coordinator of the research team.

The entire activity of Chief Assist. Dimitar Tsvetkov Peshev - scientific, research and teaching fully corresponds to the set of criteria and indicators for occupation of the academic position "Associate Professor" according to Law on the Development of the Academic Staff in Republic of Bulgaria, its Rules and Regulations for the terms for occupying an academic position.

On the basis of the above mentioned, I would strongly recommend to the Honorable Scientific Jury to vote for acquisition of the academic position of Assistant Professor by Dimitar Tsvetkov Peshev.

Candidate ranking (in case of more than one candidate who has received a positive evaluation to occupy the academic position):

Based on the assigned points, the candidates who have received a **positive** evaluation are ranked as follows:

1	Chief Assist.	Dr.	Dimitar	Tsvetkov	Peshev	80
place	academic position	scientific degree	name	middle name	last name	points

25.04.2020	The report was written by:	
date	Assoc.Prof.Dr. S.A.Uzunova	signature